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Abstract

SAFETY AND SITING CONSIDERATIONS IN THE DESIGN OF THE NFS POWER FUEL REPROCESSING PLANT

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In establishing the first privately owned spent fuel processing plant--that being built by Nuclear Fuel Services, Inc., at West Valley, Cattaraugus County, New York--a variety of new safety and siting requirements had to be considered. It is the first plant of its kind which is subject to the licensing procedure of the USAEC and thus a number of problems were focused and placed upon the public record for the first time. It was necessary under existing US law to locate this plant either upon state-owned or federally owned land. It was desirable for economic reasons to locate the plant in the north-east portion of the United States near the geographic center of the early developing load of spent fuel. This places the plant in a relatively humid area wherein problems of rainfall, water tables, and water use must be carefully considered.

A site had been selected by the State of New York as an area in which the burial of low level nuclear wastes was to be done. An intensive study of the geographic, meteorologic, geologic, hydrologic, and seismologic features of this site led to the conclusion that it was also a suitable site for the operation of a spent fuel processing plant.

A detailed discussion of the pertinent features of this site is presented. The relationship of the plant, both under normal operation and in consideration of possible operating abnormalities, to its environment is also discussed. The limiting features of plant design and operation in relation to the environment are pointed out.

Some of the special safety problems which were considered in the design of the plant in relation to its siting are: cooling time for decay of short-lived isotopes, the particular problems associated with the use of a mechanical head end, the design of storage tanks compatible with the local site, and criticality requirements. A discussion of each of these aspects is given.